

**Notice of Allowability**

Application No.

10/764,422

Examiner

Shih-Chao Chen

Applicant(s)

SREENIVAS ET AL.

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on Nov. 5, 2005.
2. ☒ The allowed claim(s) is/are 56-91.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

*Shih-Chao Chen*  
**SHIH-CHAO CHEN**  
**PRIMARY EXAMINER**

**DETAILED ACTION**

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In claims 46-55, line 1, "(Withdrawn)" is changed to --(Canceled)--.

***Terminal Disclaimer***

2. The terminal disclaimer filed on Nov. 5, 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patent No.: 6,795,020 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Allowable Subject Matter***

3. Claims 56-91 are allowed.

4. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 56-61 and 66-74 is the inclusion of the limitation of the at least a first relieved portion defines a volume that does not contain a conductive material. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

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The primary reason for the allowance of claim 62 is the inclusion of the limitation of the dielectric constant of the dielectric material in an area of the at least a first relieved portion is equal to  $e_m$ , wherein  $e_m = e_r - 0.25(e_r - 1) \pi d^2 / 0.866 S^2$ , where  $e_r$  is the dielectric constant of the dielectric material without modification, where  $S$  is a center to center spacing between the holes, and where  $d$  is a diameter of the holes. It is this limitation found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

The primary reason for the allowance of claims 63-64 is the inclusion of the limitation of the plurality of holes have a diameter  $d$  and a center to center hole spacing  $S$ , and wherein  $d < \lambda/64$  and  $S < \lambda/64$ , where  $\lambda$  is equal to a wavelength of a highest operating frequency of the antenna. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 65 is the inclusion of the limitation of the unmodified dielectric constant of the dielectric material is equal to  $e_r$ , and wherein  $S = 0.9523 d \sqrt{\frac{(e_r - 1)}{(e_r - e_m)}}$ , where  $e_m$  is a modified dielectric constant of the dielectric material, where  $S$  is a center to center spacing between holes, and where  $d$  is a diameter of the holes. It is this limitation found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

The primary reason for the allowance of claims 75-76 and 78 is the inclusion of the limitation of the means for radiating and the means for providing a ground plane are not electrically interconnected to one another by an electrically conductive material passing through the means for providing at least a first dielectric constant at the first location. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 77 is the inclusion of the limitation of at least a portion of the means for providing at least a second dielectric constant is relieved adjacent the means for radiating at least a second radio frequency. It is this limitation found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

The primary reason for the allowance of claims 79-90 (See Office action mailed on 08/05/2005).

The primary reason for the allowance of claim 91 is the inclusion of the limitation of at least a first relieved portion, wherein an electrically conductive material does not extend from a first one of the first and second surfaces to a second one of the first and second surfaces through the at least a first relieved portion. It is this limitation found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes this claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-Chao Chen whose telephone number is (571) 272-1819. The examiner can normally be reached on Monday-Friday from 7 AM to 4:30 PM, First Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shih-Chao Chen  
Primary Examiner  
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SXC  
November 28, 2005

*Shih-Chao Chen*  
**SHIH-CHAO CHEN**  
**PRIMARY EXAMINER**